Amendments to the claims

1. (currently amended)A polarization mode dispersion (PMD) compensator for compensation of PMD in polarization bit interleaved (PBI) optical signals comprising two interleaved bit streams, the compensator comprising:

a polarization controller;

a birefringent element;

a converter for converting an optical output to an electrical signal; and

an analyser for analysing at least ~~one selected spectral component of the electrical signal~~ first and second spectral components of the electrical signal, the first having a frequency corresponding to the bit frequency of the two bit streams which form the bit interleaved signal and the second having a frequency not equal to an integer multiple of the bit frequency of the two bit streams which form the bit interleaved signal,

wherein the orientation of a signal entering the birefringent element is controlled by the polarization controller in dependence on the electrical signal power of the at least one spectral component, having a frequency corresponding to the bit frequency of the two bit streams which form the bit interleaved signal.

2. (original) A compensator as claimed in claim 1, wherein the orientation of the signal entering the birefringent element is controlled so as to minimize the power of the at least one spectral component.

3. (original) A compensator as claimed in claim 1, wherein the analyser comprises a filter for extracting the at least one selected spectral component of the electrical signal.

4. (cancelled)

5. (currently amended)A compensator as claimed in claim [[4]] 1, wherein the orientation of the signal entering the birefringent element is controlled so as to maximize the ratio of the powers of the second and first spectral components.

6. (currently amended)A compensator as claimed in claim [[4]] 1, wherein the orientation of the signal entering the birefringent element is controlled so as to maximize the difference between the second and first spectral components.

7. (currently amended)A compensator as claimed in claim [[4]] 1, wherein the second spectral component has a frequency of approximately half the bit frequency of the two bit streams which form the bit interleaved signal.

8. (original) A compensator as claimed in claim 1, wherein the bit frequency of the two bit streams which form the bit interleaved signal is 20GHz.

9. (original) A polarization mode dispersion (PMD) compensator for compensation of PMD in polarization bit interleaved (PBI) optical signals comprising two interleaved bit streams, the compensator comprising:

a polarization controller;

a birefringent element;

a converter for converting an optical output to an electrical signal; and

an analyser for analysing at least two selected spectral components of the electrical signal, wherein the orientation of a signal entering the birefringent element is controlled by the polarization controller in dependence on the electrical signal powers of the at least two spectral components, a first spectral component having a frequency corresponding to the bit frequency of the two bit streams which form the bit interleaved signal, and a second spectral component having a frequency not equal to an integer multiple of the bit frequency of the two bit streams which form the bit interleaved signal.

10. (original) A compensator as claimed in claim 9, wherein the control of the orientation minimises the power of the first spectral component and maximises the power of the second spectral component.

11. currently amended) A method of providing PMD compensation for compensation of PMD in polarization bit interleaved optical signals comprising two interleaved bit streams, the method comprising:
passing the signal through a birefringent element, and controlling the polarization at an input to the birefringent element;
converting the optical output from the birefringent element to an electrical signal;
measuring the electrical signal power at a first frequency corresponding to the bit frequency of each of the two bit streams which form the bit interleaved signal; ~~and~~ measuring the electrical signal power at a second frequency not equal to an integer multiple of the bit frequency of the two bit streams which form the bit interleaved signal; and.

using the measured electrical signal ~~power~~ powers as [[a]] control ~~parameter~~ parameters for controlling the polarization at the input to the birefringent element.

12. (cancelled)

13. (cancelled)

14. (currently amended)A method as claimed in claim [[13]] 11, wherein the polarization is controlled so as to maximize the ratio of the powers at the second and first frequencies.

15. (currently amended)A method as claimed in claim [[13]] 11, wherein the polarization is controlled so as to maximize the difference between the powers at the second and first frequencies.

16. (currently amended)A method as claimed in claim [[13]] 11, wherein the second frequency is approximately half the bit frequency of the two bit streams which form the bit interleaved signal.

17. (original) A method of providing PMD compensation for compensation of PMD in polarization bit interleaved optical signals comprising two interleaved bit streams, the method comprising:
passing the signal through a birefringent element, and controlling the polarization at an input to the birefringent element;
converting the optical output from the birefringent element to an electrical signal;
measuring the electrical signal powers at a first frequency corresponding to the bit frequency of each of the two bit streams which form the bit interleaved signal and at a second frequency not equal to an integer multiple of the bit frequency of the two bit streams which form the bit interleaved signal; and

using the measured electrical signal powers as a control parameter for controlling the polarization at the input to the birefringent element.

18. (original) A method as claimed in claim 17, wherein the control minimises the power at the first frequency and maximises the power of the second frequency.

19. - 23. (Cancelled)